TITLE

"DETECTION AND ELIMINATION OF TERMITES"

FIELD OF THE INVENTION

This invention is concerned with the detection and elimination of termites internally and externally of structures.

The invention is concerned particularly although not exclusively with methods and apparatus for detection and/or elimination of subterranean termites and/or termite infestations in structures.

BACKGROUND OF THE INVENTION

Termite infestation of timber structures is a worldwide problem affecting buildings including domestic dwellings and other timber structures such as bridges, power poles and the like.

Unfortunately most termite infestations in timber structures are not discovered until after extensive damage has been done to the structure, often necessitating removal of wall and ceiling claddings or floors for access to affected structural timber beams or members. In some cases, the extent of damage in a dwelling structure may be such that it is less expensive to demolish and rebuild the structure rather than attempt in-situ repairs. For other structures such as bridges, power poles or the like, there is often no alternative other than to effect in-situ replacement. In either event, the solution to termite damage is extremely costly.

The prevalence of subterranean termite infestations is so great that many local authorities now require the application of a termiticide barrier to the soil upon which a structure such as a domestic dwelling is to be erected. Originally, such termiticides included long lasting organochlorine or organo-phosphorous compounds, but environmental and toxicity considerations now preclude such compositions. A difficulty with chemical barriers is that approved termiticide compositions have a short half-life as low as 90 days, and their effectiveness is compromised by local soil and moisture conditions in many cases.

Typically, up to 500 litres of an aqueous termiticide composition is applied to the "footprint" of the proposed dwelling before the pouring of a

concrete slab or the installation of footings and piers. Thereafter at 3 to 5 yearly intervals up to 500 litres of termiticide is applied in a trench around the structure in an endeavour to maintain the termite barrier. In some cases a reticulation system is installed under the concrete slab, but in other cases it is necessary to drill the slab to permit introduction of a liquid termiticide thereunder. While the termiticides used in this process are known to be effective in laboratory tests, there is no experimental data available to support long term in situ effectiveness but in any event the process is environmentally unacceptable.

Because of the generally acknowledged ineffectuality of chemical barrier systems it has been proposed to install stainless steel mesh or crushed granite perimeter barriers about structures such as domestic dwellings. Anecdotal evidence suggests that these physical barriers may be partially effective only if correctly installed and maintained and otherwise not bridged or bridged.

Over the last ten years colony baiting has regained some popularity with the development of termite detection stations. As it is known that termites forage randomly about 50 mm below the surface of the soil in an area of about 0.3 – 0.4 hectares surrounding a nest, it is possible to detect the presence of termites near a dwelling using strategically placed detection stations. A typical detection station comprises a plastic cylinder with or without a collar about an access port having a removable closure cap. The cylinder includes a softwood block accessible via apertures in the cylinder wall when the station is buried in the soil with the closure cap exposed. When found by foraging termites, a feeding connection is established but this can take up to several months. Once the feeding cycle is established and determined by regular viewing of the interior of the baiting station, a toxic substance mixed with a cellulosic feed base is inserted into the baiting station or inserted into the soil adjacent the baiting station in a hollow perforated stake.

Generally speaking, the termiticides used fall into either of two groups – a chitin synthesis inhibitor or a stomach poison. Chitin synthesis

inhibitors are hormonal in nature and prevent moulting of the exoskeleton in immature worker termites. Known chitin synthesis inhibitors include Hexaflumuron and Diflubenzuron. Ultimately, the non-foraging termites, including the queens, soldiers and reproductives, which in any event are unaffected by the chitin synthesis inhibitors, die of starvation. This process can take several months and requires constant supervision and replenishment of the stakes containing the termiticide.

The so-called "stomach poison" class of termiticides which include sulfluramid and sodium borate, directly poison termites feeding on cellulosic materials impregnated therewith. Sulfluramid is a slow acting toxin thought to kill protozoa in the termite's gut which enable digestion of cellulose foods. Sodium borate is typically sprayed onto infested timbers and works in a similar manner to sulfluramid – both taking from 60 – 90 days to kill the termites.

Colony baiting can be effective for detection and eradication of termites externally of a structure such as a domestic dwelling provided that sufficient bait stations are employed and that adequate and regular supervision and replacement of baited stakes occurs. There are some "do-it-yourself" kits available for homeowners for detection and eradication of termites as these do not require the services of a licensed operator to install. However the majority of termite treatment processes require the services of a licensed professional installer to install, monitor and maintain the termite detection and eradication systems.

Generally speaking, systems for detection of internal termite infestations are not employed unless there is evidence of or at least a good reason to suspect termite infestation. Methods for the detection of termite infestations include non-intrusive or non-destructive tests such as acoustic tests utilizing differing impact devices, moisture detection devices, acoustic emission devices such as a stethoscope or an electronic monitoring device. Intrusive devices may include a pointed probe, a boroscope or other optical devices inserted into a structure through a preformed aperture.

Once evidence of a termite infestation is located in, say, a

skirting board, architrave or a window or door style there is available a professionally installed termite baiting station which is secured over the infested site by screws or the like. The bait station comprises a moulded plastics box-like body with four side walls, a removable front wall secured by screws and an open rear wall. After forming an enlarged access aperture in the timber member in which infestation is discovered, the open body is secured by mounting lugs to the surface of the timber member around the aperture. A licensed operator then mixes a batch of cellulosic feed such as α methylcellulose with water and an appropriate toxin such as a chitin synthesis inhibitor or a stomach poison to form a stiff paste which is loaded into the open body of the baiting station. When fully loaded, the front wall is screwed onto the body to form a sealed chamber.

While generally effective for their intended purpose, such internal baiting stations suffer a number of disadvantages. Due to the nature of the termiticide compounds used and the fact that a fresh batch of feed containing the termiticide must be mixed on site prior to sealing the bait container, only licensed operators may install the baiting stations. Moreover, as frequent inspections and refills are required this is not only a costly exercise for the homeowner but the removal of the front cover plate at regular intervals can disturb the feeding cycle of the termite and seriously protract the treatment time required to eradicate a nest.

Accordingly, it is an aim of the present invention to provide a method and apparatus for the detection and/or eradication of termites both in subterranean environments and in structures, which method and apparatus overcome or alleviate at least some of the shortcomings of prior art systems.

SUMMARY OF THE INVENTION

According to a first aspect of the apparatus there is provided a bait station for distribution of a termiticide to foraging termites, said bait station comprising:-

a bait station for distribution of a termiticide to foraging termites, said bait station comprising:-

a hermetically sealed hollow body containing a cellulosic

feedstuff and a termiticide, said hollow body having a plurality of closed apertures therein at least one of said apertures being exposable to provide, in use, an access port for termites to enter said hollow body, said hollow body being adapted for a hermetically sealed mounting on a structure containing termites with said access port forming a pathway between an interior cavity of said hollow body and termite pathways in said structure communicating with a termite colony, said bait station characterized in that barrier located between said access port and said termiticide prevents direct access to said termiticide when said at least one aperture is exposed.

Suitably, said cellulosic feedstuff comprises a cellulosic matrix of particulate material having a termiticide dispersed therein.

The cellulosic matrix may be incorporated into said hollow body as a flowable particulate material.

Alternatively, said cellulosic matrix may comprise a compressed body of particulate material with or without a binder.

If required, said cellulosic matrix may be present in said hollow body as a hydrated mass occupying substantially the entire interior cavity of said hollow body.

The termiticide may be selected from any suitable termiticide including borate compounds, chitin synthesis inhibitors, nicotinoids, phenol ureas, phenol pyrazoles.

Suitably, a termite attractant composition may be incorporated in said cellulosic matrix.

Alternatively, said attractant composition may be incorporated in a barrier layer of corrugated cellulosic material disposed between said cellulosic matrix and an inner wall of said hollow body.

The termite attractant composition may be selected from any suitable attractant including allantoin, ellagic acid, hydroxycoumarin, urea.

The hollow body may comprise a viewing port.

If required, the viewing port may include an indicator which, in use, indicates the presence of termites adjacent thereto in said hollow body.

Preferably, said bait station is adapted for coupling to an adjacent bait station via alignable apertures in respective hollow bodies.

The bait station may be adapted for coupling to an adjacent bait station via a hollow conduit communicating with respective interior cavities of said bait stations.

If required, said hollow body may be adapted for mounting on a structure by one or more fasteners.

The bait station may be adapted for mounting on a structure containing termites by a hollow conduit extending between an interior region of said structure and said interior cavity of said bait station.

According to a second aspect of the invention there is provided a system for the detection and elimination of termites in a medium, said system comprising:-

a detector station having an apertured insertable portion for insertion into said medium and a normally exposed viewing port adjacent one end of said detector station, said viewing port, in use, permitting an indication of the presence of termites feeding on a cellulosic feedstuff in said detector station; and,

a bait station according to said first aspect of the invention, said detector station being adapted for coupling to said bait station to provide a pathway from a termite colony via said detector station to said bait station.

Suitably, said detector station comprises a hollow body having a plurality of apertures therein, said hollow body of said detector station being insertable into a soil medium to permit access to said feedstuff by subterranean termites.

The cellulosic feedstuff in said detector station may comprise a cellulosic matrix of particulate material.

Preferably, the cellulosic matrix in said detector station has a termite attractant composition incorporated therein.

If required, said attractant composition may be incorporated into a barrier layer of cellulosic material disposed between said cellulosic matrix and an inner wall of said hollow body of said detector station.

Suitably, said detector station is adapted to be coupled to an adjacent detector station in said soil medium, said detector station and said adjacent detector station being coupled by a hollow plastics conduit having a corrugated cellulosic liner therein.

Suitably, said viewing port is removable to permit coupling of

said bait station to form a pathway between an interior cavity of said detector and an interior cavity of said bait station.

Preferably, a hollow conduit extends between respective interior cavities of said detector station and said bait station.

The detector may be adapted for insertion into a timber medium by a hollow conduit insertable in an aperture formed in said timber medium.

If required, said hollow conduit may comprise a plastics tube having a liner of corrugated cellulosic medium therein.

Alternatively, said hollow conduit may comprise a timber dowel having at least one aperture extending between an interior region of said timber medium and an interior cavity of said detector station.

Said timber dowel may have said at least one aperture preformed therein or subsequently formed by a termite.

According to yet another aspect of the invention there is provided a method for the detection and elimination of termites in a medium, said method comprising the steps of:-

inserting into said medium an insertable portion of a detector station, said detector station including an exposed viewing port to detect the presence of termites feeding on a feedstuff adjacent an inner surface of said viewing port; and,

upon detection of the presence of termites via said viewing port, coupling to said detector station a bait station including a cellulosic termite feedstuff with a termiticide dispersed therein, said detector station and said bait station, when coupled, providing a pathway from a termite colony to said bait station via said detector station.

Suitably, said detector station comprises a device according to said second aspect of the invention.

Preferably, said bait station comprises a device according to a first aspect of the invention.

Throughout this specification and claims which follow, unless the context requires otherwise, the word "comprise", and variations such as

"comprises" or "comprising", will be understood to imply the inclusion of a stated integer or group of integers or steps but not the exclusion of any other integer or group of integers.

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the various aspects of the invention may be more fully understood and put into practical effect, reference will now be made to preferred embodiments illustrated in the accompanying drawings in which:-

FIG. 1 shows schematically a cross-sectional view through a detector station;

FIG. 2 shows a plurality of detector stations coupled together in-situ;

FIG. 3 shows a system for the detection and elimination of termites;

FIGS. 4-6 show partial schematic views illustrating the coupling of a bait station to a detector station;

FIG. 7 shows an alternative embodiment of a detector/bait station;

FIG. 8 shows a cross-sectional view of the embodiment of FIG. 7 in the direction A-A;

FIG. 9 shows a top plan part cross-sectional view through yet another embodiment of a detector/bait station;

FIG. 10 shows a method of installation of a detector/bait station;

FIG. 11 shows the coupling of a bait station to a detector station or the coupling of a fresh bait station to a spent bait station;

FIG. 12 shows an alternative method of coupling bait stations;

FIG. 13 shows a method and apparatus for detection of termites in a structure;

FIG. 14 shows the coupling of a bait station to the structure shown in FIG. 13; and

FIGS. 15-17 show schematically the treatment of a structural timber member thought to be infested with termites.

For the sake of simplicity, like reference numerals are employed for like features throughout the description.

DETAILED DESCRIPTION OF THE DRAWINGS

In FIG. 1, there is shown a detector station 1 having a hollow body 2 with an interior cavity 3. Body 2 has a plurality of apertures 4,5 formed in the cylindrical wall portion 2a. Secured at the top of body 2 is a cap 6 having an outwardly extending circumferential collar 7, a viewing port 8 and a closure member 9. Located within the interior cavity 3 of body 2 is a corrugated cardboard liner 10 impregnated with a termite attractant such as urea and a mass of dry α-cellulose 11.

The α-cellulose 11 may be provided in a loose particulate pourable form which is retained within body 2 by the cardboard liner 10 and closure member 9. Alternatively, the α-cellulose may be provided as a compressed block of particulate α-cellulose, with or without liner 10, the compressed mass being held together in a desired shape by a water soluble binder.

Closure member 9 may be of opaque plastics material and removable from cap 6 to inspect for the presence or otherwise of termites feeding within the body 2. Alternatively, as shown, closure 9 is formed from a transparent plastics material and a plug 12 in the form of a roll of high quality cellulose paper such as filter paper occupies the neck 13 of cap 6.

In use, the detector station with closure 9 in place may be soaked in a container of water until the α-cellulose has become hydrated or alternatively, closure 9 may be removed and an appropriate volume of water may be introduced via neck 13. Once hydrated, the device is buried in soil up to about the level of collar 7 and the disturbed soil region is moistened with water and subsequently inspected at regular intervals to detect the presence of otherwise of foraging subterranean termites. Once termites locate the detector station they enter via apertures 4,5 and commence feeding on the α-cellulose. The presence of feeding termites may be determined visually via neck 13 or evidence of termite presence may be apparent with plug 12 showing signs of faecal spotting or having been

chewed when plug 12 is viewed via a transparent closure 9.

FIG. 2 shows an in-situ installation of detector stations 1.

Around a structure such as a building (not shown) a trench 14 is dug in the soil and a plurality of moistened detector stations 1 are located at from 2 metre to 4 metre spacings with the stations resting on the floor 15 of the trench. The detector stations 1 are similar to those of FIG. 1 except that they comprise a cylindrical body 2 perforated by circular apertures 4 and slotted apertures 5, the cylindrical body having a perforated bottom cap 16 and a removable top cap 17 with a transparent viewing port 18 formed therein.

Before refilling the trench, the detector stations 1 are coupled together via apertures 4 with a plastics tube 19 having a cylindrical liner of corrugated cardboard. Tube 19 also includes perforations or apertures 20 spaced along the length of the tube. After the stations are coupled, the trench is refilled with soil to a level 21 just below top caps 17 and the soil is moistened with water before being covered with an opaque plastics sheeting 22. An attractant such as urea may be added to the soil. Plastics sheeting serves to retain moisture in the trench and if black in colour can retain warmth in the soil in the region of the trench 14.

Once the presence of termites is detected in soil around a structure such as a domestic dwelling it is then appropriate to utilize a controlled baiting system which avoids many of the shortcomings of the drenching application of termiticides to soil.

FIG. 3 shows in an exploded view a termite detector station and a bait station able to be coupled directly to the detector station after the presence of termites is determined in the detector station.

Detector station 1 is substantially identical to that shown in FIG. 1 and positioned above detector station 1 is a sealed bait station 25 comprising a hollow body 26, a removable viewing port 27 and a base member 28 adapted for coupling to the neck 13 of cap 6 of detector station 1. Contained within body 26 is a mass of α-cellulose through which is dispersed a termiticide such as FLUFENOXURON at a concentration of 1.0

g/kg of cellulosic feedstuff. FLUFENOXURON is commercially available as "FLUROX", a trade mark of Janssen Pharmaceutica.

FIGS. 4 to 6 show schematically the coupling of bait station 25 to detector station 1 after the presence of foraging termites is detected in detector station 1.

FIG. 4 shows the base member 28 of bait station 26 as comprising a downwardly depending tubular coupling port 29 sealed by a thin pierceable membrane 30, which, together with the removable viewing port shown in FIG. 2, forms a sealed container for the termiticide/feedstuff composition contained therein. When closure member 9 is removed from detector station 1, tubular coupling port 29 is insertable into neck 13 of detector cap 6. As shown in FIG. 4, coupling port 29 is a plain tubular member which slidably engages in neck 13 to facilitate removal, refilling and re-use if required.

Prior to coupling the bait station 26 with the detector station 1, a tapered wooden dowel 31 is pushed through coupling port 29 to pierce membrane 30 as shown in FIG. 5, but otherwise to maintain a sealing retention of the termiticide/feedstuff composition within bait station 26. As it is possible to hermetically seal bait station 26 with membrane 30 and sealable viewing port 27, the termiticide feedstuff may be safely shipped and handled in a wet or paste form. Alternatively, the viewing port 27 may be removed prior to breaching membrane 30 and a quantity of water added prior to resealing bait station 26.

FIG. 5 shows an alternative mechanism for coupling the bait station 26 to the detector station 1 by means of threaded engagement between a threaded outer surface on coupling port 29 and a complementary internally threaded surface (not shown) in neck 13 of cap 6.

FIG. 6 shows bait station 26 coupled to detector station 1 by a barbed projection 32 formed on the end of a coupling port 29 in the event that disconnection and re-use of the detector and/or bait stations is to be discouraged due to the nature of the toxins in the termiticide.

As shown in FIG. 6, wooden dowel 31 communicates between

the respective interior cavities of bait station 26 and detector station 1 and in a short space of time, termites foraging for food in detector station 1 begin to eat dowel 31 to form one or more tunnels through the wooden dowel and subsequently gain access to the feedstuff/termiticide composition contained in the bait station. If required, dowel 31 may be impregnated with a suitable attractant such as urea and prior to penetrating the membrane seal 30 of the bait station 26, the dowel may be soaked in water to enhance its attractiveness as a foodstuff for termites.

FIGS. 7 and 8 show an alternative embodiment of a detector/bait station suitable for detection and elimination of termites in a structure such as a domestic dwelling with a timber frame, timber power and telephone poles, timber bridge pylons and other timber structures.

In FIG. 7, the station 40 comprises a hollow rectangular body 41 with moulded end caps 42 secured at opposite ends of body 41. Body 41 is formed with a plurality of aligned circular apertures 43 in opposite walls 44 of body 41 and a plurality of aligned slotted apertures 45 located in opposite walls 46 of body 1. In addition to slotted apertures 45 in opposite walls 46 are aligned circular apertures 47. Access to apertures 43, 45 or 47 is obtained by flexible membranes 48 adhesively secured to body 41. A communicator tube 49 is locatable in a selected one of circular apertures 43 or 47, the communicator tube 49 comprising a cylindrical wooden dowel with an aperture 50 extending longitudinally thereof. Alternatively, communicator tube 49 may comprise a plastics tube lined with a corrugated cardboard liner.

End caps 42 are also formed with circular apertures 51, again accessible via a resealable flexible membrane 52. End caps 42 include one or more mounting flanges 53 to enable the station 40 to be secured in a desired orientation with either of a wall 44 or a wall 46 located against a generally flat surface of a structure via apertures 54.

FIG. 8 shows a cross-sectional view through A-A of the station of FIG. 7.

The interior cavity of hollow body 41 is lined with a corrugated cardboard or quality cellulosic liner 55 which surrounds a quantity of α-

cellulose 56 occupying substantially the entire volume of the interior cavity. For use as a detector station, the station 40 may contain α-cellulose alone and the cellulosic liner 55 may be impregnated with an attractant such as urea. When used as a bait station with a termiticide, the α-cellulose matrix may include a suitable termiticide such as FLUROX (Trade Mark). Whether used as a detector station or a bait station, a communicator tube 49 is provided with one end of central aperture 50 in communication with the cellulose matrix and the opposite end adapted for insertion into a hole of similar diameter in the structure to which the station is to be attached.

FIG. 9 shows a partial cross-sectional plan view of a modified form of station shown in FIGS. 7 and 8.

In FIG. 9 the body 41 is formed with mounting flanges 57 extending along opposite sides of a base wall 58. Mounting flanges 57 may be integrally formed with body 41 but a score line 59 is provided so that one or more of the flanges may be removed by tearing if not required. Similar score lines 59 are provided in mounting flanges 60 formed integrally with end caps 42. Base wall 58 and its opposing wall (not shown) include aligned shallow blind recesses 61 formed in respective opposing outer faces to permit accurate insertion of fasteners such as screws through the aligned recesses 61 into the supporting structure to secure the station to the structure. When the screws are inserted through the resiliently flexible plastics body 41, a fluid tight seal is formed between the shank of the screw and respective recesses 61.

One cap 42a may be formed with a "knock out" plug 62 which, when removed, forms a circular aperture having the same diameter as communicator tube 49. Cap 42b at the opposite end of body 41 includes a wire mesh viewing screen 63 and a circular disk 64 of a cellulosic paper such as filter paper or blotting paper, the purpose of which will be described later.

Screen 63 and paper disc 64 are frictionally engaged in aperture 51 such that they may be pushed inwardly to allow insertion of a communicator tube 49 is required.

FIGS. 10 to 12 show the method of use of the stations of FIGS.

7 to 9.

Depending upon whether termites are suspected of being present in a timber structure or otherwise known to be present in a structure, a non-toxicant detector station 41 including a cellulosic feedstuff and an attractant may be secured to a structure initially to encourage a feeding pattern for termites. Alternatively, if termites are actively feeding in the structure a bait station 41 containing a termiticide mixed with a cellulosic feedstuff matrix may be employed from the outset.

A hole (not shown) of about 16 mm in diameter is first drilled through, say, a skirting board 70 into a bottom plate (not shown) therebehind. A bait station 40 having a dry particulate α-cellulose matrix mixed with a suitable termiticide is dunked into a container of water after removing a flexible membrane 48 covering a circular aperture 43. Hollow wooden dowel 49 impregnated with a termite attractant is also moistened with water as is the interior of the hole drilled into the bottom plate. When the cellulosic matrix in the bait station 40 is fully hydrated, a liquid adhesive such as "No-More-Gaps" (Trade Mark), "Liquid Nails" (Trade Mark) or the like is applied to the rear face of the station 40 and around the exposed aperture 43 therein. After inserting dowel 49 into the exposed aperture 43, a quantity of the now gel-like hydrated α-cellulose is extruded down and substantially fills the hollow aperture 50. The free end of dowel 49 is then inserted into the aperture in the skirting board 70 and the station 40 is secured thereto by screws 71 extending through the body 41 of station 40 into the skirting board 70 via a selected pair of blind recesses 61. Using a caulking gun 73 or the like a filler 74 of adhesive is applied to the joint between the skirting board 70 and the edges of body 14 to form a hermetic seal between the station 40 and the skirting board 70.

At periodic intervals of, say, two weeks, membrane 52 is removed and the extent of termite feeding activity is determined via viewing port 52. If feeding activity is still significant after say six weeks from the date of commencement of feeding, the existing bait station can be effectively "re-baited" with minimal disturbance to the termites feeding therein.

As shown in FIG. 11, the membrane seal 48 over aperture 47 is removed and a bead of adhesive 75 is placed about the perimeter of the upright outer face 76 of body 41 as well as around aperture 47. A fresh bait station 77 has a membrane seal 48 removed from a central portion of one face to reveal a region of slotted apertures 45 or a corresponding circular aperture 47. After hydrating the cellulosic feed matrix/termiticide composition within the fresh bait station 77, it is secured to existing bait station 40 with respective exposed apertures aligned by screws extending through blind recesses 61 in the opposite face of station 77 into the corresponding blind recesses 61 of existing station 41. By utilizing a different pair of recesses 61 in fresh station 77, the screws 71 in existing station 40 are avoided.

It readily will be apparent to a person skilled in the art that fresh bait station 77 can be added to the top wall 78 of existing bait station 40 in the same manner as described in relation to the assembly of FIG. 11.

FIG. 12 shows yet another method of providing additional baited feedstuff to termites feeding in original bait station 40. As shown, the end plug 62 of the existing station is breached by pushing it inwardly with hollow wooden dowel 49 and a quantity of adhesive 76 is deposited around the dowel 49 at the junction with the end face of cap 42. A fresh bait station 79 with a breached end plug 62 (not shown) is then brought into axial alignment with existing bait station 40 such that dowel 49 provides a communication tunnel between the respective interiors of the fresh and existing stations with an hermetic seal formed between adjacent end caps 42. The fresh bait station may then be secured to skirting board 70 by screws through blind recesses 61 or via mounting flanges (not shown) if provided. By placing viewing port 51 at a free end of the combination, activity of termites in the fresh bait station can be monitored.

FIGS. 13 and 14 illustrate a method for detection and elimination of termites in a building structure such as a domestic dwelling.

In a typical cavity wall slab-mounted structure there is a concrete slab base 80, a timber frame having a bottom plate 81, upright wall studs 82, a brick outer cladding 83, a gypsum board inner wall cladding 84

and a timber skirting board trim 85.

In the event that subterranean termites are located by detector stations of the type shown in FIGS. 1 and 2 in the soil surrounding the structure, there is a risk that the timber support frame and trim elements such as the bottom plate 81, wall studs 82 or skirting board 85 may be infested with termites. Adjacent an external region in which subterranean termites have been located, a 16 mm hole 86 is drilled into bottom plate 81 via skirting board 85 to a depth of about two thirds the width of the bottom plate, a notched timber dowel 87 impregnated with a termite attractant is inserted into hole 86 and hole 86 is sealed with a miniature detector station 88. Detector station 88 comprises a moulded plastics body having a hollow tubular portion 89, open at a distal end thereof, which is a neat frictional fit in the mouth of hole 86. Located within the hollow tubular portion 89 is a roll or wad 92 of corrugated cardboard or some other cellulose matrix impregnated with a termite attractant. At the proximal end of tubular portion 89 is a transparent viewing window 90 behind which is a disc 91 of cellulosic filter paper or the like. The miniature detector station 88 is unobtrusive, and its installation causes only a minor impairment to the structure. In the event that no termites are located, the station 88 may be removed, the hole in the skirting board filled with a suitable filler and then spot painted to hide the filled hole.

In the event that the presence of termites is detected by faecal spotting on the filter paper disc 91 and/or by chewed portions of the disc, action can then be taken to eradicate termites travelling between the structure and a nearby nest.

After removal of the detector station 88, a wooden dowel 93 impregnated with a termite attractant and having an axially extending hole 94 extending therethrough is located in the hole 86 in skirting board 85 with about 15 – 25 mm extending outwardly from the surface of the skirting board. A bait station 95 of the type illustrated generally in FIGS. 7-9 is then coupled to the dowel 93 to form, via hole 94, a termite pathway extending between the interior cavity 96 of bait station 95 and pathways eaten in the timber

structure to the termite colony which may be located some distance from the structure. In the embodiment shown the interior cavity 96 is occupied by a layer of corrugated cellulosic cardboard 97 and a plurality of blocks 98 of a dry cellulosic matrix such as α-cellulose particles with a binder, compressed paper fibres or blocks of a suitable timber attractive to the species of termite in that locality. The cellulosic matrix is impregnated with a termiticide such as "FLUROX" (Trade Mark) or ay other suitable toxicant and before being secured in place on the skirting board 85 by screws 99 or the like, the cellulosic matrix therein is hydrated with water via one or more apertures in the body of bait station. A hermetic seal is formed between bait station 96 and the outer surface of the skirting board 85 by a soft flexible adhesive compound 96a which is exposed by removal of a flexible membrane seal. The adhesive seal 96a may be used in lieu of screws 99.

FIGS. 15 to 17 illustrate a method and apparatus for the detection and elimination of termites in structures such as telephone and power poles or structural timbers such as bridge pylons or bridge beams.

In upright monolithic structures such as trees, poles, pylons and the like as well as exposed structural beams, termites will prefer to concentrate on heartwood or otherwise selectively feed in the central region of a pole or beam to minimize the effects of moisture and temperature variations due to incident sunlight. Where only limited termite infestation has occurred, this will not adversely affect the structural integrity of the pole or beam provided termite activity is detected early and elimination follows shortly thereafter.

FIG. 15 shows a cross-sectional view of a pole or beam 100 in which a hole 101 is drilled to approximately the central axis of pole or beam 100. If termites are present in the central region of the pole this will often be detected in the process of drilling the hole 101. A solid or cored timber dowel 102, which may be impregnated with a termite attractant is moistened with water and inserted into hole 101 with about 20 – 25 mm of a proximal end extending outwardly from an outer surface 103 of pole or beam 100.

As shown in FIG. 16, a detector or baiting station 104 in the

form of a flexible plastics pouch 105 contains a dry or pre-hydrated cellulosic matrix 106 contains either a termite attractant or a termiticide depending upon its intended purpose. The pouch 105 is sealed by a flexible membrane 107 and has a transparent viewing port 108 and mounting flanges 109. After removal of the membrane 107 and hydration of the cellulosic matrix 106 if required, the pouch 105 is placed over the proximal end of the dowel 102 and then is secured to the surface 103 of pole or beam 100 by nails or screws through mounting flanges 109. A hermetic seal is formed with the surface of the pole or beam 100 by the application of a curable liquid adhesive compound as described in relation to FIGS. 10-12.

FIG. 17 shows an alternative embodiment of the pouch of FIG. 16 wherein the pouch 105 is secured to the pole or beam 100 by screws or nails 110.

It readily will be apparent to a person skilled in the art that many modifications and variations may be possible to the various aspects of the invention without departing from the spirit and scope thereof.

The detector stations, bait stations and the termite detection/elimination systems according to the invention offer substantial benefits over the prior art in that they are safe and convenient to use, even by unlicensed users. The nature of the packaging of the devices according to the invention permits cost effective storage, handling and transportation of the devices and because users can safely handle and install the devices without the risk of contacting toxic substances in the bait stations, even highly toxic substances can be used without personal or environmental risks associated with prior art systems.